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PERCEIVED LEVEL OF LATE REVERBERATION IN SPEECH AND MUSIC

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OBJECTIVES

Subjective listening tests for studying the **perceived level of reverberation**.

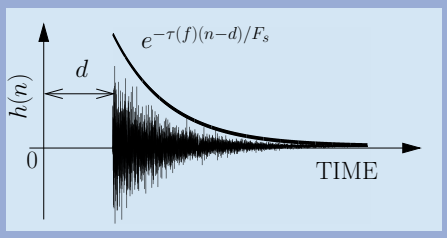
- Effect of reverberation time (T_{60}), mixing ratio (d2r), and inter-aural coherence.
- Effect of source material.
- Intra-listener consistency and inter-listener differences.

TEST SETUP

Various types of anechoic or dryish source material:

- speech
- individual instruments
- music ranging from opera to heavy metal.

Impulse responses simulating diffuse late reverberation.



THREE TESTS

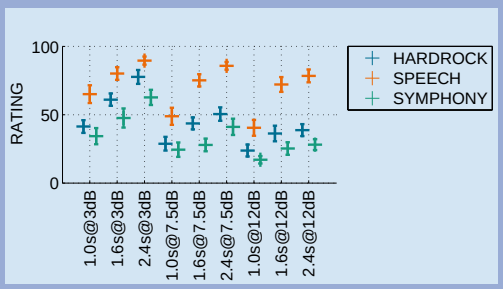
1. **Vary T_{60} and d2r** with different source material Repeat for intra-listener consistency check.
2. **Mono vs. stereo** reverberation on mono material.
3. **Inter-listener differences** with wide-ranging stimuli.

LISTENER TASK

"Rate the perceived level of reverberation on an absolute scale 0-100." Two anchor signals provided for the scale.

RESULTS

- Reverberation **tail shape** has a prominent effect on the level perceived: equal mixing levels & T_{60} increases -> rating increases.
- **Mono and stereo** reverberations with equal T_{60} and d2r are perceived to have **equal** levels.
- **Source material** has a considerable effect on the level.
- Inter- and intra-listener differences are quite similar (RMSE 14 vs. 11).
- Inter-listener differences do not depend on the variety of the test stimuli (the difficulty of the test), nor clearly from the material.



A subset of the results from Test 1 illustrating the effect of the source material on the level perceived.

FUTURE WORK

What causes the differences between material classes?

- **Physical** signal properties, e.g., onset density.
- Learned **expectations**, e.g., symphony music vs. speech..